

IDL Planning Questionnaire

Customer Version

The Planning Questionnaire needs to be completed by the planning meeting. If your concept of the instrument is not well-developed at this time, please answer the questions as best as you can. Please feel free to liberally use “TBD” for “to be defined or determined.”

Form Instructions

- Fill out all fields or list them as TBD.
- Fill out text fields by clicking in the yellow block and entering text.
- Fill out drop-down boxes by clicking in the yellow and selecting the appropriate option.
- To make things easier, hitting TAB takes you between fields that need to be filled out.

-

1) Basics

Study Name (Fill in yellow text field.)	OCE2 - Ocean Color Experiment-2
Study Date	2012 - 04 - 23

2) High Level Instrument Description

(For more instruments, use supplemental forms)

Instrument Category (Dropdown menu)	Earth Science
Instrument Name	OCE2

3) Prior Works

Have you been in the IDL before with a version of this instrument concept?	Yes
If yes, what was the name of the instrument's name in this previous study?	GOCECP
When (approximately) did this study occur?	2006 - 12 - ??

4) Science Objectives of Instrument

(List up to 5, in order of priority. For more instruments, use supplemental forms.)

Instrument 1	
Science Objectives	
Objective (1)	2 day global coverage
Objective (2)	Instrument performance tracking
Objective (3)	Minimize instrument artifacts
Objective (4)	Spatial Resolution
Objective (5)	Science Spectral Bands and SNR performance - see Table 1 in requirements document
Achievement of Objective Details (Measurements used)	
Measurements Taken (Obj. 1)	Cross-track raster style scanning instrument
Measurements Taken (Obj. 2)	Internal and external calibration reference monitors
Measurements Taken (Obj. 3)	Concept must minimize data striping, polarization sensitivity, stray light effects, spectral drift, maintain measurement stability, monthly lunar calibration observations, daily/weekly internal reference target (solar illuminated) calibration observations and vicarious ground target observations when available.
Measurements Taken (Obj. 4)	data sample iFOV = $1\text{km}^2 \pm 10\%$; $\pm 51\text{deg}$ (to $\pm 58\text{deg}$) cross-track scan extent ; look at a $(250\text{m})^2$ iFOV option
Measurements Taken (Obj. 5)	See spectral bands and SNR performance summary tables - see Table 1 in requirements document
Dependencies	
Related Instruments	What instruments are related to this instrument? PACE Mission participants
Relation	Concurrent Measurements

5) Measurement Concept

Operations Concept and Objectives	
Instrument Operations Concept	How, what, when and where will the instrument take measurements? Continuous scanning, Sunlite portion of orbit, +/- 70 deg lat., solar calibration viewing when available during orbit (at terminator crossings), 2x day inst. tilt pointing (ala SeaWiFS) to +/- 20 deg. for sun glint avoidance (minimization), monthly S/C slews for Lunar calibration scans.
Mission Affiliation	What mission will the instrument be on? PACE
Science Objective	What is the scientific objective of the mission? Ocean Ecology and Biochemistry, Coastal Ecology, Aerosol/Cloud Science
Target Observation	What is the target observation? Oceans - primary objective for this instrument
Spacecraft Orbit	What is the spacecraft orbit of this mission? Near noon crossing at equator Altitude 700km Inclination sun-sync Special maneuvers for observations: Solar viewing at terminator crossings and monthly lunar viewing (requires S/C slewing)
Other Information	How does this observation support the mission objective? OCE2 retrieves the primary measurements to address the mission objectives Give a brief explanation how the observation is dependent on the orbit parameters Passive radiometer requires well sun-lite scenes for best performance.

Related Works	
Coordination	<p>Does this instrument need to coordinate its measurements with another instrument?</p> <p>No</p> <p>If yes, describe how the measurements are coordinated.</p> <p>No, in general but a polarimeter (3MI from ESA ?) will be accommodated on PACE</p>
Alternate Means	<p>Are there other trades or alternative options that are being considered for the instrument concept?</p> <p>No</p> <p>Explain.</p> <p>We'll attempt to just study one design/concept approach. There may be TBD trades that become evident as the study proceeds.</p>
Prior Work	<p>Is there relevant previous work or analysis that will be useful for this study?</p> <p>Yes</p> <p>If yes, please make available to the IDL.</p> <p>Are there CAD models, optical models, particular trade studies, technologies, design strategies that you would like the conceptual concept in this IDL study to consider or utilize?</p> <p>Yes</p> <p>What are they?</p> <p>ODL concept models available (Qian Gong + Dave Palace) and the previous GOCECP - circa Dec. 2006 study. We can recycle the relevant SeaWiFS heritage sub-system parts/components of this previous study. In particular, the scanning & momentum compensator mechanism approach, the +/- 20 deg. tilt mechanism and the solar illuminated internal reference target approach, although we'll add more reference target options ala GOCECP.</p> <p>Please make models available to the IDL prior to the pre-work meeting.</p>

Integration and Dependence	
Descope	<p>Are there descopes considered for this instrument?</p> <p>No</p> <p>Explain.</p> <p>Nothing comes to mind right now.</p>
Detectors	<p>Do you have an assumption about what type of detector you will use?</p> <p>Yes</p> <p>Explain:</p> <p>Silicon and InGaAs single detector elements perhaps with custom coating to achieve the best QE.</p>
Dependencies	<p>What other instrument technologies are critical to making the required observations?</p> <p>Let's cool the detectors, especially the InGaAs to minimize dark current and noise. The instrument tilt mechanism and momentum compensator can be copied directly from SeaWiFS heritage.</p>
Other Information	<p>What are the tall poles for this instrument?</p> <p>Number of spectral bands, SNR performance and electronics accomodation (~144 discrete channels)</p> <p>What are the institutional partnerships involved in this instrument?</p> <p>None at this time.</p>

6) Study Objectives

Main Objective	What would you like to achieve in this IDL study? Instrument Concept Comments or specifics: Design, feasibility and costing	
Study Objective	In one sentence what is your study objective for this IDL study? Concept feasibility, science applicability and costing credibility.	
Subsystems	Check off your assessment of what subsystems will be needed in the study:	
	Subsystem	Necessity
	Attitude Determination/Control	Not Needed
	Contamination	Most Challenging
	Cryogenics	Not Needed
	Cost Evaluation	Most Challenging
	Detector	Most Challenging
	Electrical	Most Challenging
	Flight Software	Most Challenging
	Mechanical Systems	Most Challenging
	Mechanical Design	Most Challenging
	Mechanisms	Most Challenging
	Structural Analysis	Most Challenging
	Thermal	Most Challenging
	RF/Microwave	Not Needed
	Orbital Debris and/or Micro-meteorite Assessment	Not Needed
	Reliability	Most Challenging
	Optical Analysis	Most Challenging
	Flight Dynamics	Not Needed
	Lasers and Laser Technology	Not Needed
	Integration & Test	Most Challenging
Radiometry/Radiometric analysis	Most Challenging	

Results	<p>What are/will the results of this IDL study used/be used for?</p> <p>Report</p> <p>Please give specifics.</p> <p>Report to NASA HQ as information only.</p> <p>What date do you need the completed IDL study products such as the mass and cost estimate?</p> <p>2012 - 05 - dd</p> <p>What date do you need preliminary results?</p> <p>2012 - 05 - dd</p>
---------	--

7) Customer Contact Information

Name and Affiliation	Phone	E-mail
Primary Customers		
Betsy Parks - HQ:3M73	202-358-4639	betsy.edwards@nasa.gov
Paula Bontempi - HQ:3D76	202-358-1508	paula.bontempi@nasa.gov
Others Involved From Customer Team		
Angela Mason - GSFC Code 420	301-286-8547	angela.j.mason@nasa.gov
Rick Wesenberg - GSFC Code 592	301-286-7638	richard.p.wesenberg@nasa.gov
Chi Wu - GSFC Code 599	301-286-7536	chi.k.wu@nasa.gov
Jay Smith - GSFC Code 550	301-286-5185	james.c.smith@nasa.gov